

**Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1. (currently amended) A multilayer microculture comprising a plurality of three-dimensional non-fluid layers, wherein each layer comprises cells of at least one cell type and a contained within a polymerized biopolymer matrix comprising a biopolymer selected from the group consisting of collagen, chitosan, fibronectin, laminin, matrigel, fibrin, and mixtures thereof, wherein the cells are distributed throughout the matrix, and wherein the layers are positioned vertically on top of each other so that each layer contacts at least one other layer, and wherein each layer comprises a width vertical thickness less than one millimeter.
2. (Currently Amended) The microculture according to claim 1 wherein each layer comprises a distinct cell type that is distinct from the cell types in other layers.
3. (Original) The microculture according to claim 1 wherein at least one layer comprises a plurality of cell types.
4. (Original) The microculture according to claim 1 wherein at least one layer is attached to an optically transparent support.
5. (Currently Amended) The microculture according to claim 1 wherein said layers comprise a first layer that is immobilized and wherein said first layer is resistant to a shear force of 80 dyne/cm<sup>2</sup> associated with a 5 µl/min lateral flow of a cell biopolymer fluid across the face of said first layer.
6. (Original) The microculture according to claim 1 wherein said microculture mimics a mammalian tissue.

7. (Original) The microculture according to claim 1 wherein said cell type is a non-contractile cell.

8. (Withdrawn) A method for producing a multilayer microculture

(a) introducing a first material comprising a first cell matrix compound and a first cell type to a microstructure by microfluidic delivery, wherein said material is introduced as a fluid;

(b) attaching said first material to at least one surface of said microstructure;

(c) incubating said first material under conditions suitable for at least one component of said material to polymerize and for said material to contract in at least one dimension; and

(d) repeating step (a) with a second material comprising a second cell matrix compound and a second cell type;

(e) attaching said second material to said first material; and

(f) incubating said second material under conditions suitable for at least one component of said second material to polymerize, thereby producing a multilayer microculture.

9. (Withdrawn) The method according to claim 8 wherein said first cell type and said second cell type are the same.

10. (Withdrawn) The method according to claim 8 further comprising:

(a) incubating said second material under conditions suitable for said second material to contract; and

(b) preparing a third layer of microculture by repeating steps (d)-(f) of claim 8.

11. (Withdrawn) The method according to claim 8 wherein said microstructure comprises a plurality of microchannels and at least one microfluidic aperture.

12. (Withdrawn) The method according to claim 8 wherein said material is a cell culture medium.

13. (Withdrawn) The method according to claim 8 wherein said conditions comprise time sufficient for said material to become a gel.

14. (Withdrawn) The method according to claim 8 further comprising attaching said material to said support.

15. (Withdrawn) The method according to claim 14 wherein said support is a derivatized glass.

16. (Withdrawn) The method according to claim 15 wherein said glass is derivatized by the presence of amine groups.

17. (Withdrawn) The method according to claim 16 further comprising an aldehyde cross-linker attached to at least one of said amino groups.

Claims 18-19 (canceled)

20. (Withdrawn) A method for identifying a modulator of tissue development comprising:

(a) incorporating a candidate modulator of tissue development into at least one layer of a microculture according to claim 1;

(b) incubating said microculture; and

(c) measuring the tissue development in the presence of said candidate modulator relative to the tissue development in the absence of said candidate modulator,

wherein a difference in response relative to a microculture lacking said candidate modulator identifies a modulator of tissue development.

Claims 21-25 (Canceled)

26. (Withdrawn) The method according to claim 20 further comprising attaching said microculture to a solid support.

27. (Withdrawn) The method according to claim 20 wherein each layer of said microculture comprises a distinct cell type.

28. (Withdrawn) The method according to claim 20 where at least one layer of said microculture comprises a plurality of cell types.

29. (New) The microculture according to claim 1 comprising three layers, wherein a first layer comprises endothelial cells, a second layer comprises smooth muscle cells, and a third layer comprises fibroblasts.